

## A HUB ASSEMBLY FOR AN UMBRELLA FRAME

### BACKGROUND OF THE INVENTION

#### Claim of Priority

The present application is based on and a claim to priority is made under 35 U.S.C. Section 119(e) to a provisional patent application currently pending in the U.S. Patent and Trademark Office having Serial No. 60/437,103 and a filing date of December 30, 2002.

#### Field of the Invention

This invention relates to umbrellas, and more particularly, to a hub assembly for an umbrella frame. The hub assembly of the present invention offers improvements primarily, but not exclusively, in durability and the withstanding of abusive weather conditions.

### DESCRIPTION OF THE RELATED ART

Large, standing outdoor umbrellas are commonly utilized at restaurants, bars, hotels, and other places that offer outdoor seating so as to shield people from the sun, as well as from other elements of nature, such as wind, light rain, etc. As such, these types of outdoor umbrellas typically have been designed to endure some of these elements. Nevertheless, damage to the framework of an umbrella can and does occur for many

1 reasons. For example, umbrellas can be damaged by severe and  
2 unexpected weather and strong winds can cause a standing outdoor  
3 umbrella to fall over, which can cause component parts of the  
4 umbrella frame to become cracked or bent. Others suffer damage  
5 as a result of improper handling, such as when a worker moves  
6 them from one location to another quickly or recklessly and/or  
7 as a result of improper installation. Many of the umbrellas  
8 known in the art suffer the disadvantages of not being able to  
9 withstand strong winds or other harsh weather, as well as not  
10 being capable of simple repair when damage does occur.

11 For example, many standing outdoor umbrellas utilize a wood  
12 material, which quite often is highly polished, for the hub  
13 assembly, ribs, struts, and other frame components due to the  
14 pleasing esthetic effect which it offers. However, these  
15 assemblies often require that screws or other connectors be  
16 driven into the wood material, which compromises the material's  
17 strength and integrity. In particular, when these types of  
18 umbrellas fall over, a common result is that the wood splits at  
19 the site or sites where a screw has been screwed into the wood.  
20 Unfortunately, once an umbrella is damaged in this way, it is  
21 often more expensive and difficult to repair the frame  
22 component(s) of the umbrella than it is to replace them or in  
23 some cases, the umbrella itself. This is especially true when  
24 the wood hub assembly of the umbrella frame has been split or  
25 otherwise damaged.

1           SUMMARY OF THE INVENTION

2           The present invention is intended to present a solution to  
3           some of the problems in this field of art, and as such, relates  
4           to a hub assembly for an outdoor umbrella which is better able  
5           to withstand the forces to which they are commonly subjected.  
6           The hub assembly of the present invention is also better suited  
7           towards being repaired in a relatively simple manner in the  
8           event it were to become damaged.

9           The hub assembly of the present invention comprises a hub  
10          member having a central aperture sized to receive a pole member  
11          of the umbrella frame and capable of sliding up and down the  
12          pole member. The hub member includes an upper portion and a  
13          lower portion, and in a first embodiment, further includes a  
14          band secured about a periphery thereof between the upper and  
15          lower portions, with a plurality of brackets secured to at least  
16          the band, but ideally also to the hub member. The brackets are  
17          structured to pivotally receive an end of a strut member of the  
18          umbrella frame, as further described in greater detail herein.  
19          In another embodiment, the hub member further includes a channel  
20          formed generally in the upper portion thereof, which is defined  
21          by at least a lower ledge, but ideally an upper ledge as well,  
22          extending entirely or substantially about a periphery of the hub  
23          member. The channel has a height dimension that is sized to  
24          correspond generally with the height dimension of said brackets.  
25          Preferably, a band is also secured to the hub member in this

1 embodiment, but secured within the channel and about the hub  
2 member. However, the present invention also contemplates an  
3 embodiment of the hub member which includes the channel but not  
4 the band secured thereto, i.e., wherein the brackets are  
5 received within and secured directly within the channel to the  
6 hub member.

7 In another embodiment, the inventive hub member has upper  
8 and lower portions which are separate and distinct from one  
9 another, and which collectively form a channel between them in  
10 an assembled orientation. Here as well, the channel formed  
11 between the upper and lower portions is preferably defined by at  
12 least one ledge, such as a bottom ledge, but preferably also a  
13 top ledge as well, with the height of the channel sized to  
14 correspond to the height of a plurality of brackets to be  
15 secured within the channel and to the hub member.

16 In yet another embodiment, the hub member additionally  
17 comprises a ring, and most preferably, a ring having a solid,  
18 one piece construction. In the illustrated embodiment, the ring  
19 includes a first exposed, horizontally oriented surface and a  
20 second exposed, horizontally oriented surface, and further, the  
21 upper portion of the hub member is disposed adjacent to the  
22 first exposed ring surface and the lower portion of the hub  
23 member is disposed adjacent to the second exposed ring surface  
24 in an assembled orientation. The ring preferably also includes  
25 a plurality of pre-formed brackets structured to pivotally

1 receive an end of a strut member of the umbrella frame, and  
2 further, is free to rotate about the pole member, at least, if  
3 not within or between the hub member's upper and lower portions.

4 A primary object of the present invention is to provide a  
5 hub assembly for an umbrella frame which is less likely to  
6 crack, split, explode or suffer other damage as a result of the  
7 umbrella's falling over or undergoing windy conditions or other  
8 stress and forces.

9 Another object of the present invention is to provide a hub  
10 assembly for an umbrella frame which is capable of withstanding  
11 fluctuations between hot and cold temperatures, as well as  
12 withstanding extreme temperatures, and also, wind and other  
13 weather conditions.

14 It is a further object of the present invention to provide  
15 a hub assembly for an umbrella frame which provides better  
16 stability for brackets and/or other components used in attaching  
17 the rib and/or strut members to the umbrella frame.

18 It is another object of the present invention to provide an  
19 umbrella frame having easily replaceable and interchangeable  
20 parts.

21 Still another object of the present invention is to provide  
22 an improved hub assembly which in at least one embodiment is  
23 capable of rotating about the pole member of the umbrella frame,  
24 at a minimum.

1           BRIEF DESCRIPTION OF THE DRAWINGS

2           Figure 1 is a is a partial, exploded, front elevational  
3       view showing an umbrella frame -- with which the present  
4       invention may be used -- in an open position, and further, a  
5       partially closed position as indicated by the phantom and dashed  
6       lines.

7           Figure 2 is an exploded perspective view of a hub assembly  
8       for an umbrella frame according to one embodiment of the present  
9       invention.

10          Figure 3-A is an isolated view of a hub assembly according  
11       to another embodiment of the invention.

12          Figure 3-B is an isolated view of a hub assembly similar to  
13       that of Figure 3-A but wherein the hub assembly is a split hub  
14       assembly.

15          Figure 4 is an isolated view of a hub assembly according to  
16       yet another embodiment of the invention, shown assembled and in  
17       place on an umbrella frame in an open orientation.

18          Figure 5-A is an isolated perspective view of a ring to be  
19       incorporated in one embodiment of a hub assembly according to  
20       the present invention.

21          Figure 5-B is a partial perspective view of the bottom side  
22       of the ring illustrated in Figure 5-A.

1           DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

2           The present invention is directed to a hub assembly 10 for  
3           an umbrella, and preferably, but not necessarily, a large,  
4           upright, outdoor umbrella of the type used at restaurants, bars,  
5           and on patios, decks, etc. While this invention is susceptible  
6           of embodiment in many different forms, there is shown in the  
7           drawings and will herein be described in detail at least one  
8           specific embodiment, with the understanding that the present  
9           disclosure is to be considered as an exemplification of the  
10          principles of the invention and is not intended to limit the  
11          invention to the embodiment or embodiments illustrated.

12          By way of background, and with reference to Figure 1, the  
13          umbrella with which the invention is utilized will typically  
14          include a frame 100 having a longitudinally extending, central  
15          pole member 120, which can be made of wood, aluminum or another  
16          material, and which has a top end 140 and a bottom end 160. The  
17          bottom end 160 may be easily secured to the ground or any means  
18          of vertical affixment, although in the preferred embodiments the  
19          bottom end 160 may be secured within a base, not shown, which  
20          will ideally have wheels to facilitate movement of the umbrella  
21          from one place to another. The hub assembly 10, which is  
22          designed and configured to be interconnected with other  
23          components of the umbrella frame 100, has a central cavity 15,  
24          best shown in Figure 2, extending axially therethrough for  
25          placement about the central pole member 120 and is slidably

1 between the top 140 and bottom 160 ends of the pole member so as  
2 to permit the opening of the umbrella, as well as the closing of  
3 the umbrella, as indicated by the phantom lines shown in Figure  
4 1. In at least one embodiment, the hub assembly 10 is also  
5 capable of rotating about the axis of the pole member 100.

6 As also shown in Figure 1, the umbrella frame 100 also  
7 includes an upper or secondary hub member 18 near the top end  
8 140 of the pole 120. In the more preferred embodiments, this  
9 secondary hub member 18 is provided with a central cavity 19  
10 extending axially therethrough for receiving the top end 140 of  
11 the pole 120, as shown in Figure 2, and ideally, is structured  
12 and configured to securely depend from the top end 140 of the  
13 pole, an inventive feature described in a previously filed U.S.  
14 patent application of the inventor herein, namely, Serial No.  
15 10/008,536 filed on November 13, 2001, incorporated herein by  
16 reference. For example, and as shown in Figure 1, the central  
17 pole member 120 can include a threaded bolt 65 (whether secured  
18 to an exterior surface thereof or formed to extend from an  
19 interior thereof). This threaded bolt 65 is of a length  
20 sufficient to extend through a narrow upper portion of the  
21 central cavity 19 of the secondary hub member 18 such that a nut  
22 tightened about the bolt 65 will be capable of maintaining the  
23 secondary hub member 18 in substantially rigid position about  
24 the pole 120. When desired, however, the nut may be loosened  
25 somewhat so as to allow the secondary hub member 60 to rotate

1       about the pole's axis, a feature which is helpful during windy  
2       or other adverse weather conditions. A finial or end cap 17 can  
3       also be secured to the bolt 65 for aesthetic purposes once a  
4       canopy has been positioned atop the umbrella frame 100. The end  
5       cap 17 also maintains the fabric canopy in a secured central  
6       position.

7               Still referring to Figure 1, the umbrella frame 100  
8       includes a plurality of rib members 70 which form the outer  
9       framework of the umbrella and also a plurality of strut members  
10      80. The rib and strut members may similarly be made of wood,  
11      plastic, or aluminum, another metal or other material, and the  
12      umbrella frame 100 can utilize any desired number and size of  
13      rib and strut members, depending on the particular size and  
14      shape of the umbrella canopy to be attached. Each of the rib  
15      members 70 are preferably secured pivotally at a top end thereof  
16      to the upper or secondary hub member 18. Each of the strut  
17      members 80 are preferably secured pivotally at a first end 82 to  
18      the hub assembly 10 and are also preferably secured pivotally at  
19      a second end 84 to the rib members 70 at a point near the  
20      approximate midpoint of the rib members. The strut members 80  
21      provide support for the rib members when the umbrella frame is  
22      in the extended or open position. The preferred pivotal  
23      attachment of the rib members 70 to the upper or secondary hub  
24      18 and of the strut members 80 to the hub assembly 10 will be  
25      discussed in greater detail subsequently herein. As also shown

1       in Figure 1, a retaining pin 112 can be attached to the hub  
2       assembly 10 and can be placed within a retaining pin slot formed  
3       within the pole 120 in order to maintain the vertical position  
4       of the hub assembly 10 along the pole 120. In addition, the pin  
5       112 can be secured to the hub assembly 10 via a cord having a  
6       noose loosely secured about the waist 13 of the hub assembly 10  
7       so as to allow for the free rotation of the hub assembly 10  
8       about the pole 120, even when the pin 112 is in place within the  
9       pin retaining slot. Other structures can be utilized to  
10      maintain the vertical position of the hub assembly 10 along the  
11      pole 120, although ideally an inventive feature described as a  
12      “cam cleat member” in a previously filed U.S. patent application  
13      of the inventor herein will be used, with said feature being  
14      shown and described fully in U.S. Patent No. 6,386,214 issued on  
15      May 14, 2002, and also in Serial No. 10/008,536 filed on  
16      November 13, 2001, both of which are incorporated herein by  
17      reference.

18           Referring more in particular now to the hub assembly 10, it  
19      is pointed out that in many embodiments it will be formed out of  
20      wood, preferably polished to offer a refined appearance, but  
21      that it could also be made from a number of other materials. In  
22      addition, the hub assembly 10 can have many different shapes,  
23      but preferably, includes both an upper portion 12 and a lower  
24      portion 14. As is perhaps best shown in Figure 2, the hub  
25      assembly 10 ideally includes a waist 13 so as to result in a

1 generally hour-glass shape which provides comfort and which  
2 ergonomically fits better into one's hand for maneuverability of  
3 the hub assembly 10 up and down along the umbrella frame's  
4 central pole member 120.

5 In at least one embodiment, and as illustrated in Figure 4,  
6 the hub assembly 10 of the present invention also includes a  
7 band 20. In particular, the band 20, which can be made from a  
8 thin, flat strip of steel or other metallic material is  
9 preferably wrapped around the girth of the hub assembly 10,  
10 ideally at or near the upper portion 12 thereof and is fixed in  
11 this location. For example, the band 20 may be secured to the  
12 hub assembly 10 by a set of screws driven into the wood of the  
13 hub assembly 10 so as to anchor the opposite free ends of the  
14 band 20. For the purpose of pivotally attaching the first ends  
15 82 of the strut members 80 to the hub assembly 10, a plurality  
16 of bracket members 40 are affixed to the periphery of the band  
17 20, for example, by way of one or more screws 44 being driven  
18 through each bracket member 40, through the underlying band 20  
19 and into the wood or other material of the hub assembly 10. It  
20 is contemplated that the band 20 may be formed from other  
21 materials, including but not limited to other metals,  
22 composites, plastic, etc. In addition, the brackets may be made  
23 of a metal material, probably a stamped metal, but could also be  
24 made of other materials, including plastic.

25

With reference now to Figure 3-A, the hub assembly 10 illustrated in these embodiments includes a channel 30 formed around its girth. Ideally, the channel 30 is formed at or near the upper portion 12 thereof and further, is defined by both a bottom ledge 32 and a top ledge 34 as shown in Figure 2 and 3-A. Alternatively, and although not illustrated in the drawings, the channel 30 may be defined by only one ledge, such as bottom ledge 32. The channel 30 is preferably sized and dimensioned to correspond to the size and dimension of the bracket members 40, such that the rear wall 42 of each bracket member 40 fits within the channel 30 and rests on the ledge 32 or ledges 32, 34. In these embodiments, the bracket members 40 may also be secured within the channel 30 by way of one or more screws 44 driven directly into the wood or other material of the hub assembly 10. Alternatively, and with reference to Figure 4, a metal band 20 can be wrapped around the hub assembly at or preferably within the channel 30, and the bracket members 40 can then be secured thereto by one or more screws. It is contemplated that the channel 30 adds to the stability of the bracket members 40 due to their being kept in vertical alignment by the channel 30, and ideally, both top and bottom ledges 32, 34 thereof. In other words, this channel structure 30 helps to prevent the rotation or twisting and displacement of the bracket members 40, and consequently, they are less likely to become loosened and thereby yield an umbrella frame assembly which is more durable

1 and stable. Further, the bracket members may be readily secured  
2 and removed from the channel structure, via screw 44, as shown  
3 in Figure 2. While a screw member is shown as the means of  
4 attachment for the brackets to the hub member 10, other forms of  
5 attachment may be employed, such as a machine threaded bolt,  
6 fitted notch or other element. Also shown in Figure 3-A is a  
7 "cam cleat member" 90 described briefly previously herein, which  
8 along with other components, not shown, permits the raising and  
9 lowering of the hub assembly 10 along the central pole member  
10 120 to open and close the umbrella.

11 In yet another preferred embodiment, and with reference now  
12 to Figure 3-B, the hub assembly 10 can be formed to have an  
13 upper portion 12 that is separate and distinct from the lower  
14 portion 14, and as such, this embodiment may be termed a 'split'  
15 hub assembly. In particular, the lower portion 14 of the hub  
16 assembly 10 can be formed to include both the waist 13 and the  
17 channel 30, preferably with only bottom ledge 32 as discussed  
18 previously herein, and in this embodiment, the upper portion 12  
19 is formed to define a ring or disk like top having a slightly  
20 larger dimension so as to define upper ledge 32, as illustrated  
21 in Figure 3-B. In this embodiment, the lower portion 14 of the  
22 hub assembly 10 is mounted onto the pole of the umbrella first,  
23 and then, the upper portion 12 can be mounted on the pole as  
24 well, such that a channel 30 having both a bottom ledge 34 and  
25 a top ledge 32 is created and sandwiched between the upper and

1 lower portions 12, 14. In other words, in this embodiment the  
2 upper and lower portions 12 and 14 are collectively sized and  
3 formed to create the channel 30 therebetween in the assembled  
4 condition, with preferably, the channel 30 being sized and  
5 dimensioned to correspond to the size and dimension of the  
6 bracket members 40, such that each bracket member 40 fits within  
7 the channel 30 and may be secured within the channel 30 by way  
8 of one or more screws driven directly into the hub assembly 10.  
9 If desired, a band 20 can be included within the channel of this  
10 embodiment.

11 The present invention contemplates yet another embodiment  
12 of a 'split' hub assembly, which will now be described with  
13 reference to Figures 5-A and 5-B. In particular, a ring 50 may  
14 be sandwiched between the separate and distinct upper and lower  
15 portions of the hub assembly on the pole 120, although in this  
16 embodiment, the ring 50 is preferably not secured to either, but  
17 instead, is free to rotate about the pole 120 and between the  
18 upper and lower portions. Ideally, the ring 50 is made from a  
19 plastic material so as to be durable and weather resistant, and  
20 further, has a single, one-piece configuration which includes a  
21 plurality of pre-formed brackets therein. For example, the pre-  
22 formed brackets may comprise a plurality of "U" shaped openings  
23 52a, 52b, 52c, 52d, this shape being preferred for providing  
24 clearance to the ends 82 of strut members. In the illustrated  
25 embodiment of the invention shown in Figures 5-A and 5-B, the

ring 50 is provided with eight "U" shaped openings so as to accommodate up to eight struts 80, to allow correspondence with a design for an umbrella canopy having eight rib members 70 and strut members 80 or less, such as six or four, as well. The ring 50 may also include other pre-formed brackets, such as a plurality of generally "V" shaped openings 54a, 54b, 54c, 54d formed therein, with each having a ledge formed at generally a mid-point of each opening, with there being ideally eight (8) in number as well. In the illustrated embodiment, one of the exterior surfaces, such as the bottom surface as shown in Figure 5-B may be substantially flat so as to form an approximately or generally about ninety degree angle with the outer edges which define the pre-formed brackets, whereas the opposite exterior surface, such as the top surface shown in Figure 5-A may have a curved and/or sloped angle at these junctures.

As shown in Figures 1, 2 and 4, the secondary hub member 18 is also provided with brackets for pivotally receiving the upper ends of rib members 70. The rib members 70 form the outer framework of the umbrella frame of the present invention whereas the strut members 80 provide support for the rib members when the umbrella frame is in the extended or open position. As shown in Figure 2, pivotal attachment of the rib and strut members to their respective brackets and hub members may occur by using a single screw extending through the bracket, such as at hole 45, through the strut member (or rib member) and through

1 hole 46, where it can be bolted in place. Other like connectors  
2 can be used to allow the strut or rib members to be easily  
3 secured and removed from the brackets and indeed, for the  
4 brackets themselves to be easily replaceable. The rib and strut  
5 members may be made of aluminum or wood, for example. Also, and  
6 as shown in Figure 1, the strut members 80 may be pivotally  
7 secured to the rib members 70 by a collar member 96, which has  
8 been described in a prior U.S. patent application, identified  
9 previously herein and/or in a related "parent" patent  
10 application. Also, with the present invention, many different  
11 configurations of the canopy can be achieved. For example, four  
12 rib members can be employed to form a square shaped canopy,  
13 eight rib members can be employed for an octagonal shaped  
14 canopy, three rib members can be employed for a triangular  
15 shaped canopy, six rib members can be employed for a rectangular  
16 shaped canopy and five rib members can be employed for a semi-  
17 octagonal shaped canopy. The number of ribs to be employed  
18 determines the number of strut members, and brackets to be  
19 employed. For example, with four rib members, four strut  
20 members and four brackets are employed. Canopies of varying  
21 shapes and sizes are attached to the umbrella frame by  
22 unscrewing the finial or end cap 17 from the top end 14 of the  
23 pole 12 and removing a securing nut. The canopy opening is  
24 placed over the threaded bolt 65 and the canopy cuffs are placed  
25 around the outer ends of the rib members. The securing nut and

1 finial 17 are then placed back onto the threaded bolt 65. In  
2 one embodiment of the invention, the canopy members are  
3 SUNBRELLA 100% solution-dyed acrylic canopies or any other  
4 shade-like or non-shade like material.

5 When the frame is in the retracted position, as shown in  
6 phantom in Figures 1, the inventive hub member 10 is near the  
7 bottom end 160 of the pole 120. As the hub member 10 is lifted  
8 up the pole 120, the strut members 80 extend outwardly, thereby  
9 expanding the rib members 70 and opening the attached canopy.  
10 As the strut members 80 pass the point where they extend  
11 perpendicularly from the pole member 120, the strut members 80  
12 lock into place against a hub stop member (not shown) secured to  
13 the pole, and the retaining pin member 112 may then be placed  
14 within its retaining slot on the pole 120 and the hub member 10  
15 may then be returned downwardly to rest against the pin member  
16 112. In this position, the strut members 80 extend in a  
17 substantially perpendicular fashion from the pole member 120 to  
18 provide substantial support to the rib members 70. With the  
19 present invention, the umbrella's frame 100 may be rotated by a  
20 loosening of the end cap 17 and securing nut from the pole's top  
21 end 140, in an amount sufficient to allow for either slight or  
22 ready rotation of the hub member 10, 18 about the pole 120. The  
23 umbrella frame may also employ a cable and pulley system,  
24 preferably with a cam mechanism 90 shown in Figure 3-A, to allow  
25 the user to easily raise the hub member 10 and thereby open the

1       umbrella and/or lower it to close the umbrella.

2              The rigidity and density of all the components described  
3 herein can be tempered for a desired flexibility as needed. The  
4 pole, rib, and strut members may be comprised of metal, wood or  
5 fiberglass but not limited to these rigid compositions. The  
6 nature of thermoplastic construction with materials like ABS,  
7 DELRIN, POLYPROPOLYNE and other ACETALS allow for a degree of  
8 flexibility in the members of the umbrella frame. In heavy wind  
9 conditions the static frame work moves a few degrees in many  
10 directions and the tension of this movement is absorbed but not  
11 released. This type of stress over time degrades the structural  
12 integrity of an umbrella. Because these plastics have a degree  
13 of flexibility, the energy that normally would be absorbed by a  
14 completely static frame umbrella is distributed through all of  
15 the plastic components of the umbrella. This greatly increases  
16 the life of the static frame of an outdoor umbrella which is  
17 generally the more costly portion of an umbrella unit.

18              The invention may be embodied in other specific forms  
19 without departing from the spirit or essential characteristics  
20 thereof. The present embodiments are therefore to be considered  
21 in all respects as illustrative and not restrictive, the scope  
22 of the invention being indicated by the appended claims rather  
23 than by the foregoing description, and all changes which come  
24 within the meaning and range of equivalency of the claims are  
25 therefore intended to be embraced therein.

1           What is claimed and desired to be secured by Letters Patent  
2       is:  
3